

AI for Virtual Humans

Project



A bit of background...

- *Major goal at ICT:*
Create compelling VR environments for training
 - High quality graphics
 - Immersive sound
 - Strong storyline
 - Virtual humans

AI Virtual Humans

- Behaviors not pre-scripted
 - Behave by understanding situation and reasoning about possibilities
- Communicate in natural language
- Can explain actions & coach
- Respond emotionally to situation

Looking back....

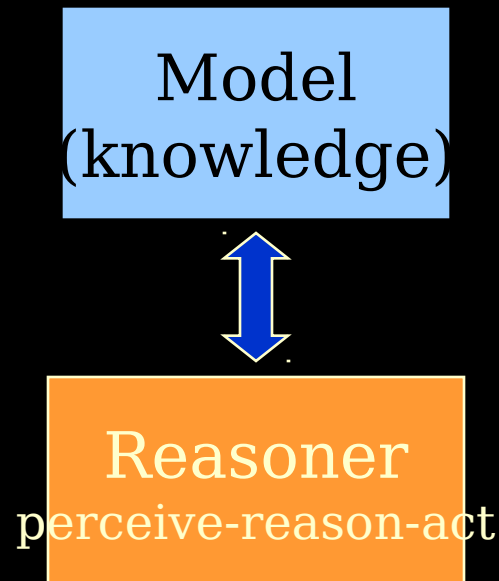
- Early attempts failed to create unified intelligent systems exhibiting a broad variety of behaviors

What's different now?

- Faster, more powerful (& cheaper) hardware
- Some of the hard problems have working solutions
 - e.g. speech recognition
- Better software environments support modular architectures
 - Don't have to build it all yourself
- Hybrid approach: synergy through mixing techniques
 - Symbolic, probabilistic, neural nets, etc

What's different now? (cont'd)

- Model based programming



Example: Model Based Programming for Task Oriented Domain

Model

Task1	Task2	Task3	Task4
Preconditions:	Preconditions:	Preconditions:	Preconditions:
Effects:	Effects:	Effects:	Effects:



Reasoner



Task3 → Task4 → Task1

- Robust to changes in world state
- Model easier to modify
- Model explainable
- Model can be used to understand other's actions

Mission Rehearsal Project: Operations in the New Millennium



Mission Rehearsal Exercise Project

- Virtual Reality Environment
 - Immersive Audio and Graphics
 - Virtual Humans with reasoning and emotion
 - Locals
 - Friendly and hostile elements
 - Coach
 - Dilemmas and decisions

Bill Swartout



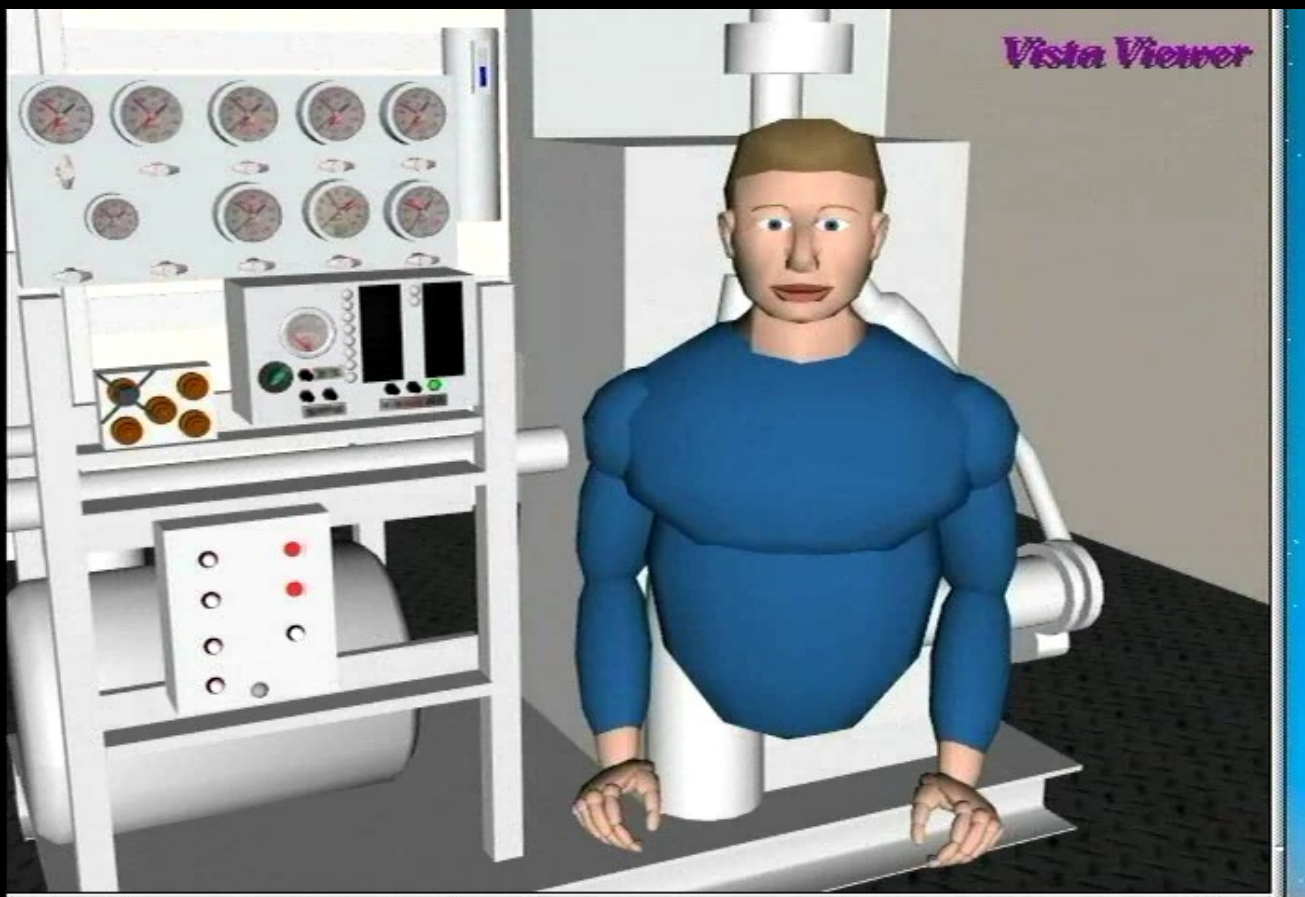
ICT Virtual Reality Theater



Mission Rehearsal Clip

Coaching

Missing Emotions



Adding Emotions



Summary

- Using AI we're beginning to create characters that have much richer behaviors and depth
- Opens up possibility for new kinds of games